

Sudhan Bhattarai

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Education

Clemson University

Ph.D. in Industrial Engineering

Advisor: Associate Professor Dr. Yongjia Song

Clemson, SC

Aug. 2021 – Aug. 2025

Colorado State University-Pueblo

M.S. in Industrial and Systems Engineering

Advisor: Associate Professor Dr. Leonardo Bedoya-Valencia

Pueblo, CO

Aug. 2019 – May 2021

Tribhuvan University, Institute of Engineering

B.E. in Industrial Engineering

Kathmandu, Nepal

Aug. 2012 – May 2016

Experience

Clemson University

Graduate Research Assistant & PhD Candidate

Clemson, SC

Jan. 2022 – Present

- Developed adaptive decision policies for logistics networks under demand uncertainty using stochastic programming.
- Enhanced policy efficiency by applying distributionally robust optimization on historical data to minimize worst-case costs.
- Integrated autoregressive time series models into optimization frameworks to improve decision-making.
- Incorporated a Martingale time-series model of forecast updates to optimize decisions based on dynamically evolving forecasts.
- Designed case studies modeling real-world logistics constraints, operational challenges, and decision environments.
- Developed scalable solution techniques for large-scale stochastic optimization using Benders Decomposition and Stochastic Dual Dynamic Programming (SDDP).
- Analyzed cost-efficiency trade-offs and provided insights for strategic logistics planning and resource allocation.
- Developed scalable optimization models in Python with Gurobi for real-world logistics applications.
- Conducted extensive data analysis, including preprocessing, visualization, statistical testing, and hypothesis testing in python and R, using pandas, numpy, scipy, tidyverse, matplotlib, seaborn, ggplot2.
- Conducted parallel and large-scale computing in Clemson University's Palmetto Cluster, utilizing SLURM job scheduling and secure remote access via SSH on Linux systems.
- Utilized Git and GitHub for version control, enabling efficient collaboration, code management, and tracking of project progress.

Graduate Teaching Assistant

Aug. 2021 – Dec. 2021

- Mentored students and provided academic support in Industrial Applications of Probability and Statistics.

Colorado State University-Pueblo

Graduate Assistant & MS Candidate

Pueblo, CO

Aug. 2019 – May 2021

- Developed a Mixed-Integer Programming (MIP) model for nurse routing and scheduling, improving operational efficiency.
- Implemented and solved the model in Python using Gurobi, validating results through real-world case studies.
- Conducted Pareto frontier analysis to evaluate trade-offs among cost, employee satisfaction, and service quality.
- Enhanced operational efficiency of a home-healthcare agency by conducting statistical analysis and process optimization using Arena Simulation.
- Built and optimized machine learning models (KMeans, Linear/Logistic Regression, SVM, Decision Tree, Random Forest, and Gradient Boosting) using scikit-learn in Python.
- Designed and trained deep learning models (DNN, CNN, and RNN) using TensorFlow and Keras in Python for healthcare datasets.
- Conducted extensive data preprocessing, hyperparameter tuning, and model evaluation to improve predictive accuracy.

- Mentored undergraduate students in engineering design and mechanics, enhancing their analytical and problem-solving skills.

Teaching Instructor

Aug. 2020 – Dec. 2020

- Designed and delivered lectures for Introduction to Engineering, promoting student engagement and improving learning outcomes.

Additional Experience

Morang Auto Works (MAW) Earthmovers Pvt. Ltd.

Lalitpur, Nepal

Technical Sales Representative

Nov. 2017 – Jan. 2019

- Developed and maintained client relationships, utilizing data-driven insights to enhance sales strategies.
- Organized and participated in industry expos, promoting business growth and market expansion.

Honors

INFORMS Student Chapter, Clemson University

Clemson, SC

President

Aug. 2022 – May 2023

- Led events, including orientation sessions, conference preparation seminars, and K-12 outreach programs.
- Awarded *Magna Cum Laude* at INFORMS Annual Meeting, 2023.

Presentations

INFORMS Annual Meeting

Seattle, WA

Invited Session Presenter

Oct. 2024

- **Title:** Multi-stage Stochastic Programming for Integrated Network Optimization in Hurricane Relief Logistics and Evacuation Planning.

INFORMS Annual Meeting

Phoenix, AZ

Community Committee Choice Session Presenter

Oct. 2023

- **Title:** Multi-Stage Stochastic Programming for Integrated Hurricane Evacuation and Logistics Planning.

IISE Annual Conference

New Orleans, LA

Contributed Session Presenter

May 2023

- **Title:** Integrated Hurricane Relief Logistics and Evacuation Planning under Forecast Uncertainty: A Case Study for Hurricane Florence.

INFORMS Annual Meeting

Indianapolis, IN

Community Session Presenter

Oct. 2022

- **Title:** Stochastic Optimization Methods for Integrated Hurricane Relief Logistics and Evacuation Planning.

Publications

- **Bhattacharai, Sudhan**, and Yongjia Song. “Multistage stochastic programming for integrated network optimization in hurricane relief logistics and evacuation planning.” *Networks* 85.1 (2025): 3-37. <https://doi.org/10.1002/net.22249>
- **Bhattacharai, Sudhan**, and Yongjia Song. “Integrated Hurricane Relief Logistics and Evacuation Planning under Forecast Uncertainty: A Case Study for Hurricane Florence.” *Proceedings of the IISE Annual Conference & Expo 2023*. <https://par.nsf.gov/biblio/10428837>
- **Bhattacharai, Sudhan**, Yaneth Correa-Martinez, and Leonardo Bedoya-Valencia. “A multi-objective home healthcare routing problem.” *International Journal of Healthcare Management* 16.2 (2023): 311-325. <https://doi.org/10.1080/20479700.2022.2102111>